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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/800,512	03/08/2001	Takanobu Takeda	KOJIM-383	5073

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EXAMINER	
LEE, SIN J	

ART UNIT	PAPER NUMBER
1752	7

DATE MAILED: 12/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/800,512	TAKEDA ET AL.
	Examiner	Art Unit
	Sin J Lee	1752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 October 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-13,15 and 16* is/are rejected.

7)☒ Claim(s) *6 and 14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: "Recent Statutory Changes to 35 USC 102(e)"

DETAILED ACTION

1. In view of the amendment filed on October 7, 2002, the previously made 103(a) rejections over Takechi et al'690 in view of Allen et al'184 and Aldrich's Catalog Handbook of Fine Chemicals 1996-1997 and the previously made 103(a) rejections over Takechi et al'690 in view of Kobayashi et al and Aldrich's Catalog Handbook of Fine Chemicals 1996-1997 are hereby withdrawn. Neither of Takechi et al in view of Allen et al and Takechi et al in view of Kobayashi et al teaches or suggests the presently claimed polymer (1) with the provision that *q and r are not both 0.*

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 5 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In both of claims 5 and 13, the variable "a" for formula (4) is not defined. Appropriate correction is required. For the purpose of examining the claims on the merit, the Examiner assumed that the variable "a" is an integer of 0 to 6 based on present specification, pg.7, lines 28 and 29.

5. Please take a note of ***Recent Statutory Changes to 35 U.S.C. 102(e)*** as explained in the attachment to this Office action.

6. Claims 1, 2, 4, 5, 7, and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Choi et al (6,284,438 B1).

In Example 9, Choi teaches a photoresist composition containing a polymer mixture of *poly(hydroxystyrene-t-butyl methacrylate)* (Mw of 12,500) and *poly(t-butoxycarbonyloxystyrene-hydroxystyrene)* (Mw of 12,700), triphenyl sulfonium triflate (*a photoacid generator*), propylene glycol monomethyl ether acetate (an organic solvent), and triethanolamine (*a basic compound*).

The poly(t-butoxycarbonyloxystyrene-hydroxystyrene) meets the present formula (1) since in the present formula (1), r and s can both be zeros, x and m in the first and second

repeating units can both be zeros, y and n both can be an integer of 1, R^1 can be hydrogen, R can be a hydroxyl group, and R^3 can be a t-butoxycarbonyl group (which is the acid labile group of formula (4) of present claim 5 - since present a can be zero, and present R^{17} can be a t-butyl group which is a branched alkyl group of 4 carbon atoms).

The poly(hydroxystyrene-t-butyl methacrylate) meets the present formula (2): The hydroxystyrene unit in the poly(hydroxystyrene-t-butyl methacrylate) teaches the first repeating unit of the present formula (2) since R^6 can be hydrogen and k can be an integer of 1. The *t-butyl* methacrylate unit in the poly(hydroxystyrene-t-butyl methacrylate) teaches both of the third and fourth units of the present formula (2) since the *t-butyl* moiety meets both description for present R^{10} (branched alkyl group of 4 carbon atoms) and present R^{11} (tertiary alkyl group of 4 carbon atoms). Since there is no requirement in present claim language that present third and fourth repeating units have to be two different units, it is the Examiner's position that the t-butyl methacrylate unit in Choi's poly(hydroxystyrene-t-butyl methacrylate) teaches both of the third and fourth units of the present formula (2) (therefore, Choi's poly(hydroxystyrene-t-butyl methacrylate) satisfies present limitation that t and w each are positive number, u and v each are 0 or a positive number, either one of u and v is not equal to 0).

Therefore, the prior art teaches present inventions of claims 1, 2, 4, 5, and 8.

The poly(hydroxystyrene-t-butyl methacrylate) used in the polymer mixture in Choi's Example 9 meets his chemical formula 3 shown in col.5, lines 30-35, and in the formula, Choi teaches that the ratio of q/q+p is from 0.1 to 0.5. Since 0.1 is clearly taught as the lower end of

the range, it is the Examiner's position that one of ordinary skill in the art would immediately envisage the ratio of q/q+p to be 0.1. Since Choi's q unit (with R_6 being the t-butyl group) teaches both of the third (the v unit) and fourth (the w unit) units of present formula (2) (as discussed above), the prior art's teaching (i.e., the ratio of q/q+p being 0.1) satisfies present equations of present claim 7 (present u can be zero). Therefore, Choi teaches present invention of claim 7.

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Choi et al (6,284,438 B1) in view of Houlihan et al (5,843,624).

Choi et al is discussed in Paragraph 6 above. Choi does not teach presently claimed dissolution regulator. However, it is well known in the art, as evidenced by Houlihan et al (col.3, lines 58-65, col.5, lines 48-52, lines 64-67, and col.6, lines 1-5) to add a dissolution inhibitor to a resist material containing a polymer already having acid labile groups pendant thereto. When one combines a dissolution inhibitor with a polymer already having acid labile groups pendant thereto (as in Choi's polymers used in his Example 9), the contrast between the portion of the resist material that is exposed to radiation and the unexposed portion is enhanced because the alkali solubility of both the polymer and the dissolution inhibitor is altered by the acid generated by the photoacid generator when the resist material is exposed to radiation and post-exposure baked. Therefore, based on Houlihan's teaching, it would have been obvious to one of ordinary skill in the art to additionally employ a dissolution inhibitor in Choi's resist material in order to enhance the contrast between the exposed and unexposed portions of Choi's resist material as

taught by Houlihan et al. Therefore, Choi in view of Houlihan would render obvious present invention of claim 3.

8. Claims 9-13, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi et al (6,284,438 B1) in view of Houlihan et al (5,843,624).

Choi et al is discussed above in Paragraph 6. As discussed above, in Example 9, Choi teaches a photoresist composition containing a polymer mixture of *poly(hydroxystyrene-t-butyl methacrylate)* (Mw of 12,500) and *poly(t-butoxycarbonyloxystyrene-hydroxystyrene)* (Mw of 12,700), triphenyl sulfonium triflate (*a photoacid generator*), propylene glycol monomethyl ether acetate (an organic solvent), and triethanolamine (*a basic compound*), and the Examiner established that the poly(t-butoxycarbonyloxystyrene-hydroxystyrene) meets the present formula (1).

Choi's poly(hydroxystyrene-t-butyl methacrylate) does not teach present formula (2) of claim 9 since in the present formula (2), R^{11} can only be represented by present formula (5) or (6) shown in claim 9. The t-butyl moiety in Choi's poly(hydroxystyrene-t-butyl methacrylate) is an acid-labile group, and it is well known in the art that t-butyl group and 1-methylcyclohexyl group are equivalent acid-labile groups as evidenced by Houlihan et al, col.5, lines 8-9. Because Houlihan et al teach the equivalence of t-butyl group and 1-methylcyclohexyl group as acid-labile groups, it is the Examiner's position that it would have been obvious to one of ordinary skill in the art to replace the t-butyl methacrylate unit in Choi's poly(hydroxystyrene-t-butyl methacrylate) with the 1-methylcyclohexyl methacrylate unit so as to make poly(hydroxystyrene-

1-methylcyclohexyl methacrylate) in Choi's Example 9. Since 1-methylcyclohexyl moiety teaches present formula (5) of claim 9 (since R^{18} can be a methyl group, and b can be an integer of 3), Choi in view of Houlihan would render obvious present inventions of claims 9, 10, 12, 13, 15, and 16.

With respect to present claim 11, as discussed above in Paragraph 7, Choi does not teach presently claimed dissolution regulator. However, it is well known in the art, as evidenced by Houlihan et al (col.3, lines 58-65, col.5, lines 48-52, lines 64-67, and col.6, lines 1-5) to add a dissolution inhibitor to a resist material containing a polymer already having acid labile groups pendant thereto. When one combines a dissolution inhibitor with a polymer already having acid labile groups pendant thereto, the contrast between the portion of the resist material that is exposed to radiation and the unexposed portion is enhanced because the alkali solubility of both the polymer and the dissolution inhibitor is altered by the acid generated by the photoacid generator when the resist material is exposed to radiation and post-exposure baked. Therefore, based on Houlihan's teaching, it would have been obvious to one of ordinary skill in the art to additionally employ a dissolution inhibitor in Choi's resist material in order to enhance the contrast between the exposed and unexposed portions of Choi's resist material as taught by Houlihan et al. Therefore, Choi in view of Houlihan would render obvious present invention of claim 11.

9. Claims 6 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim

and any intervening claims since present claims 6 and 14 require the presence of the last repeating unit of present formula (1) and Choi does not teach or suggest such polymer.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is (703) 305-0504. The examiner can normally be reached on Monday-Friday from 8:30 am EST to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Janet Baxter, can be reached on (703) 308-2303. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9311 for after final responses or (703) 872-9310 for before final responses.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0661.

S. J. L.

S. Lee
December 15, 2002

JANET BAXTER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

Recent Statutory Changes to 35 U.S.C. § 102(e)

On November 2, 2002, President Bush signed the 21st Century Department of Justice Appropriations Authorization Act (H.R. 2215) (Pub. L. 107-273, 116 Stat. 1758 (2002)), which further amended 35 U.S.C. § 102(e), as revised by the American Inventors Protection Act of 1999 (AIPA) (Pub. L. 106-113, 113 Stat. 1501 (1999)). The revised provisions in 35 U.S.C. § 102(e) are completely retroactive and effective immediately for all applications being examined or patents being reexamined. Until all of the Office's automated systems are updated to reflect the revised statute, citation to the revised statute in Office actions is provided by this attachment. This attachment also substitutes for any citation of the text of 35 U.S.C. § 102(e), if made, in the attached Office action.

The following is a quotation of the appropriate paragraph of 35 U.S.C. § 102 in view of the AIPA and H.R. 2215 that forms the basis for the rejections under this section made in the attached Office action:

> **A person shall be entitled to a patent unless –**
>
> **(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.**

35 U.S.C. § 102(e), as revised by the AIPA and H.R. 2215, applies to all qualifying references, except when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. For such patents, the prior art date is determined under 35 U.S.C. § 102(e) as it existed prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. § 102(e)).

The following is a quotation of the appropriate paragraph of 35 U.S.C. § 102 prior to the amendment by the AIPA that forms the basis for the rejections under this section made in the attached Office action:

> **A person shall be entitled to a patent unless –**
>
> **(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.**

For more information on revised 35 U.S.C. § 102(e) visit the USPTO website at www.uspto.gov or call the Office of Patent Legal Administration at (703) 305-1622.